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ABSTRACT

The research reported in this document was an attempt to replicate the study by Wish, Cautela, and Steffen, and to test the effects of covert reinforcement on overt behavior. The subjects were 50 college students who were presented the task of estimating the diameter of each circle in a series presented by slide projector. Pre- and post-treatment estimations of the circle size provided the criterion measure. All subjects filled in the Reinforcement Survey Schedule and were assigned to one of five experimental conditions. The major research hypothesis was that differences in mean circle estimation would be greatest for subjects in the covert reinforcement condition. This hypothesis was not supported by the results of this research. While the earlier study found significant differences among treatments, the present replication found no significant differences among treatment conditions or interactions. (Author/PC)

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COVERT REINFORCEMENT: A REPLICATION OF AN EXPERIMENTAL TEST BY WISH, CAUTELA, AND STEFFEN

by

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Introduction

Overcoming their intiial reluctance to deal with internal responses, behaviorally oriented psychologists have recently been demonstrating considerable interest in covert response processes and their influence on overt behaviors (Johnson and Elson, 1974 and Mahoney, 1974). Among a number of covert conditioning procedures described by Cautela (1971), covert reinforcement is a clinical procedure in which clients are taught to self-present imagined positive stimuli to reinforce imagined adaptive responses as a means of producing overt behavior change. The clinical use of covert reinforcement has been described in a number of anecdotal reports (Wisocki, 1970; Cautela, 1972; Kendrick and McCullough, 1972; Blanchard and Draper, 1973; Cautela and Baron, 1973; and Wisoki, 1973). None of these reports is a controlled study that can attribute overt behavior change to imagined reinforcers. Perhaps the best experimental investigation of the influence of covert reinforcement on overt behavior has been a study by Wish, Cautela, and Steffen (1970). In this well controlled laboratory study, the investigators found that subjects' estimates of diameters of circles could be modified by cueing subjects to covertly reinforce themselves for either under- or over-estimations. An attempt to replicate this study (Ripstra, Elson, Johnson, Schmickley, Rate, and Yager, 1974) failed to find significant difference between the covert reinforcement condition and a control condition in which subjects were contingently presented with the cue but who had no instructions to imagine reinforcers. In the original study an effect was found for contingent cueing, but the addition of instructions to covertly reinforce on cue produced a significant effect beyond that of cueing alone.

Because the Wish, Cautela, and Steffen's study is an important one in covert reinforcement research and because the procedures in the replication attempted by Ripstra and others deviated from the original study in some respects, another replication was thought to be warranted. The research reported here was an attempt to replicate the study by Wish, Cautela, and Steffen and to test the effects of covert reinforcement on overt behavior.

Method

Subjects

The subjects were 50 students at Michigan State University, 26 females and 24 males. Subjects were volunteers who responded to an invitation to participate in a learning experiment.

Task

All subjects were presented the task of estimating the diameter of each circle in a series presented by a slide projector on a white screen. The actual size of the circles when projected ranged from 4 to 9 inches in one inch increments. Each of the six circle sizes was presented three times in a randomly ordered series of 18 slides to obtain a mean estimation for each circle size for each subject. Each of the six circles was then presented six more times in a random ordering of 36 slides while one of the five experimental conditions was in effect. A final presentation of the first set of 18 circles provided post-treatment estimations that when compared with pretreatment estimations provided the criterion measure.

Experimental Conditions

All subjects filled in the Reinforcement Survey Schedule (Cautela and Kastenbaum, 1967) which asked them to rate on a five point scale the amount of pleasure they derived from a number of activities or things. Subjects were

then randomly assigned to one of five experimental conditions with 10 subjects in each condition. The procedure for each condition was as follows:

Covert Reinforcement Condition. Subjects in this treatment condition selected from among those activities they checked as pleasing them "very much" on the Reinforcement Survey Schedule an activity that was most pleasing. They were asked to visualize as vividly as possible a scene in which they were engaged in the pleasurable activity. Visualization of this scene was practiced until subjects reported that they could generate it quickly and visualize it clearly. Subjects were then instructed to visualize the scene each time the experimenter said the word "reinforcement". A few practice trials were held to make sure that subjects understood instructions and reported that they could visualize the scene clearly following the cue word, "reinforcement".

Subjects in this experimental condition were told that a series of circles would be shown on the screen in front of them and that they were to estimate the size of the circles, the diameters, as closely as possible in inches, half inches, and/or quarter inches. The subjects were then presented with the series of 18 circles. This provided a pretest from which a mean response to each of the six different sized circles was determined. Subjects were then reminded to imagine the practiced scene in response to the cue word, "reinforcement". During the presentation of the set of 36 circles, the experimenter said "reinforcement" contingent upon the subject's size estimation. Half of the subjects randomly chosen were cued to present the imagined scene following overestimations of the circle size, and half of the subjects were cued following underestimations. Over- and underestimations were in terms of the subject's mean pretest estimation of each circle size not in term of actual circle size.

If a subject was reinforced, he was allowed five seconds in which to clearly visualize his scene before the next circle was presented. During the posttest presentation of the circles, no cueing was done.

Neutral Scene Condition. Subjects in this condition were treated in the same manner as the Covert Reinforcement condition except that they were asked to select an activity from the "not at all pleasurable" end of the Reinforcement Survey Schedule. A scene in which they imagined themselves engaging in this "not at all pleasurable" activity was practiced and self-presented in response to the cue word, "reinforcement" as in the covert reinforcement condition.

Noncontingent Condition. Subjects in this condition were asked to imagine a very much pleasing scene in the same manner as subjects in the Covert Reinforcement condition, but during the presentation of the 36 circles the cue word was presented in a random manner not contingent on over- or underestimations.

Word "Reinforcement" Alone Condition. Subjects in this group were not asked to visualize a scene, but during the 36 circle presentation, the word "reinforcement" was presented either upon over- or underestimations depending upon the random assignment to these two contingencies.

No Feedback Condition. Subjects in this condition did not imagine a scene. The cue word "reinforcement" was not presented to them. They simply filled out the Reinforcement Survey Schedule, were given some placebo attention, and asked to estimate the sizes of the circles during the pretest set of 18, the second set of 36, and the posttest set of 18.

The design and number assigned to each cell were identical to that used in the Wish, Cautela, and Steffen's study.

TABLE I

NUMBER OF SUBJECTS PER CELL IN THE 5× 2 DESIGN

	Covert Reinforcement	Neutral	Non-Contingent	Word	No Feedback
Overestimation	10	10	10	10	10
Underestimation	10	10	10	10	10

Results

Pretest-posttest difference scores on the circle size estimation were used as the criterion measure in this study. The major research hypothesis was that differences in mean circle estimation would be greatest for subjects in the covert reinforcement condition. This hypothesis was not supported by the results of this research. No significant differences were found among treatment conditions or interactions (ANOVA, $p.>.05$).

Wish, Cautela, and Steffen (1970) found significant differences among treatments (ANOVA, $p<.01$). Using a Duncan Multiple Range test, they found the Covert Reinforcement condition to have produced significantly greater pre-post differences in circle estimation than any of the four other treatment conditions. The replication reported here does not support the findings of Wish, Cautela and Steffen. No significant treatment effects were found in the analysis of variance

using pre-post difference scores as a criterion measure. The mean difference scores for the Word "reinforcement" Alone condition were actually as high or higher than for the Covert Reinforcement condition as show in Table 2.

TABLE 2

MEAN PRE-POST DIFFERENCE SCORES
Circle Size Estimation *

	Covert Reinforcement	Neutral	Non-Contingent	Word	No Feedback	Mean
Overestimation	-.67	-.86	-.02	-.33	-.95	-.57
Underestimation	+.51	+.41	-.37	+.51	+.39	+.29
Mean	-.08	-.22	-.20	+.09	-.28	-.14

* Differences among means not significant (ANOVA, $p > .05$)

There was a tendency to underestimate, that is, initial estimates were generally larger than subsequent ones. No treatment in the Overestimation condition overcame the general tendency to underestimate. All means in this Overestimation condition are negative indicating that posttest estimates were smaller than pretest estimates. Means in the Underestimation condition are positive (with one exception) indicating that posttest scores were smaller than pretest scores. For the research hypothesis to be supported, the mean difference score for the Covert Reinforcement condition would have been higher, in relative value, than for other conditions. Such was not the case. One might reason that the investigators in this replication were less skilled in helping students visualize and use the reinforcing scenes, and thus the Wish, Cautela and Steffen was not fairly tested. This, however, would not explain

the failure in the replication to obtain a difference due to the cue word alone found in the original study.

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